

Lairdmannoch Energy Park

Design and Access Statement

Lairdmannoch Energy Park Limited wind2

May 2025



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Glossary of Terms

Term	Definition
The Applicant	Lairdmannoch Energy Park Limited
The Agent	Atmos Consulting Limited
Environmental Advisors and Planning Consultants	Atmos Consulting Limited
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development
Environmental Impact Assessment Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations)
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Proposed Development	Lairdmannoch Energy Park
The Proposed Development Site	The full application boundary as per Figure 1
Wind Development	The area of the Proposed Development that contains the Wind Turbines and associated infrastructure. As shown on Maps 1, 2 and 4 of Figure 3.
Solar Development	The area of the Proposed Development that contains the Solar Arrays and associated infrastructure. As shown on Maps 7, 8 and 9 of Figure 4.



List of Abbreviations

Abbreviation	Description		
agl	Above ground level		
ANC	Association of Noise Consultants		
ASA	Archaeologically Sensitive Area		
BESS	Battery Energy Storage System		
CIfA	Chartered Institute for Archaeologists		
DGC	Dumfries and Galloway Council		
EIA	Environmental Impact Assessment		
EIAR	Environmental Impact Assessment Report		
ECU	Energy Consents Unit		
GDSP	Galloway Dark Skies Park		
GIS	Geographic Information System		
IOA	Institute of Acoustics		
LVIA	Landscape and Visual Assessment		
NCNR	National Cycle Network Route		
NGR	National Grid Reference		
NPF4	National Planning Framework 4		
NTS	Non-Technical Summary		
PAC	Pre-Application Consultation		
PLI	Public Local Inquiries		
RTPI	Royal Town Planning Institute		
SAC Special Area of Conservation			
SPA Special Protection Area			
SSSI	Sites of Special Scientific Interest		



1 Introduction

This Design and Access Statement (DAS) has been prepared by Atmos Consulting Limited ('Atmos') on behalf of Lairdmannoch Energy Park Limited ('the Applicant') to support the application for Consent under Section 36 of the Electricity Act (Scotland) 1989 (as amended) to develop an energy park consisting of up to nine wind turbines up to 180m in tip height, ground mounted solar panels, a battery energy storage system (BESS) and associated infrastructure (the 'Proposed Development').

The associated infrastructure includes:

- 6.1 kilometres (km) of upgraded existing access track;
- 12.64km of new access track (of which 12.15km will be cut and 0.49km will be floated);
- Turbine foundations and crane hardstandings;
- Substation;
- One borrow pit;
- Underground cabling;
- Temporary construction compound;
- Solar infrastructure including a power station and switching and breaking station; and
- Up to eight watercourse crossings.

The Proposed Development Site is centred on National Grid Reference (NGR) NX 66233 62404, located approximately 7km north east of Gatehouse of Fleet and 10km west of Castle Douglas in Dumfries and Galloway and is illustrated in **Figure 1**.

The Proposed Development Site occupies an area of approximately 612.2ha.

The Proposed Development will have a total installed capacity of 100MW. This consists of 60MW from wind generation, 20MW from solar, and 20MW from a battery energy storage system (BESS).

The application is accompanied by an Environmental Impact Assessment Report (EIA Report) prepared in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations').

The EIA Report presents the findings of the EIA process by describing the Proposed Development, the current conditions at the Proposed Development Site and the likely environmental effects which may result from the construction and operation of Proposed Development.

Where appropriate, mitigation measures designed to avoid, reduce or offset potentially significant effects are proposed and conclusions are presented on residual effects (those effects that are expected to remain following implementation of mitigation measures).

This Design and Access Statement does not form part of the EIA Report but should be read in parallel with it as many of the references in the Design and Access Statement refer to material produced in full in the EIA Report.



1.1 The Applicant

Lairdmannoch Energy Park is being developed by Lairdmannoch Energy Park Limited (the Applicant), which is part of a joint venture between Wind 2 Limited (Wind2) and companies managed by Octopus Energy Generation.

Wind2 is a specialist renewable energy developer which is working on the development of a range of renewable energy projects across the UK. The company has personnel in Edinburgh, Perth, Cromarty, Wells (Somerset) and in Mold in North Wales. Further information on Wind2 can be found on its company website at <u>https://wind2.co.uk</u>.

Octopus Energy Generation are one of Europe's largest investors in renewables, operating £4 billion of green energy generation across seven countries. Octopus Energy Generation operate solar and wind projects across the UK.

The Applicant is committed to investing in Dumfries and Galloway through renewable energy projects, with the community benefits and additional outcomes that renewable energy development can bring (including construction and post construction employment).

1.2 Role and Purpose

The purpose of this Design and Access Statement is to set out the design principles and concepts that have been applied in relation to the Proposed Development.

Although not a statutory requirement for Consent applications under the Electricity Act, it is considered good practice, and hence this DAS has been produced taking into consideration the Scottish Government Planning Circular 3/2013: Development Management Procedures (Scottish Government 2013) and the Scottish Government Planning Advice Note (PAN) 68: Design Statements (Scottish Government, 2003).

However, it should be noted that the guidance is significantly dated and not written with this type of development (an energy park comprising onshore wind, solar panels and BESS) in mind. The content has therefore been adapted to suit the Proposed Development.

This DAS has also considered Regulation 13 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (as amended, the' DMP Regulations') which specifies the detailed requirements of the content of a DAS in relation to an application for planning permission under the Town and Country Planning Act (Scotland) 1997.

Regulation 13 of the DMP Regulations states that a design and access statement is a written statement which:

"(a) explains the policy or approach adopted as to design and how any policies relating to design in the development plan have been taken into account;

(b) describes the steps taken to appraise the context of the development and demonstrates how the design of the development takes that context into account in relation to its proposed use; and

(c) states what, if any, consultation has been undertaken on issues relating to the design principles and concepts that have been applied to the



development and what account has been taken of the outcome of any such consultation."

This DAS covers the following matters:

- Section 2: Site Description and Context;
- Section 3: Site Selection and Design Evolution;
- Section 4: Final Design Overview;
- Section 5: Access; and
- Section 6: Conclusion.



2 Site Description and Context

2.1 Site Description

The Proposed Development Site is centred on National Grid Reference (NGR) NX 66233 62404, located approximately 7km north east of Gatehouse of Fleet and 10km west of Castle Douglas in Dumfries and Galloway. The Proposed Development Site occupies an area of approximately 612.2ha and is shown bounded by the red line on Figure 1.

With the exception of the southwestern access track, the land cover within the Proposed Development Site consists of predominantly upland bog with wet heath in the vicinity of the proposed wind farm infrastructure to the west (the Wind Development) and lowland pasture to the east in the vicinity of the solar farm infrastructure (the Solar Development). The land use across the Proposed Development Site is livestock grazing.

2.2 Surrounding Area

The Proposed Development Site features several watercourses, including but not limited to the Tarff Water and Anstool Burn.

The nearest turbine from the Proposed Development is a minimum of 1.5km from the nearest residential properties and settlements. The villages of Ringford and Twynholm lie mid-way, to the south of the Proposed Development Site, with the former at the junction of the A762 which runs northwards through the village of Laurieston, to the east of the Proposed Development Site, before reaching New Galloway just outside the detailed study area, and ultimately Ayr to the north.

Although the valleys are well settled, the hills are generally devoid of settlement. The Proposed Development Site benefits from a good existing road network. The main communications route, the A75 trunk road between Dumfries and Stranraer, runs eastwest to the south of the Proposed Development Site, between the towns of Castle Douglas to the east of the study area and by-passing Gatehouse of Fleet to the west.

The Proposed Development Site is suitable for biodiversity enhancement and for restoration of peatland.

2.3 Landscape Designations

The Proposed Development Site does not fall within any nationally designated landscapes (Figure 2). The Zone of Theoretical Visibility (ZTV) indicates that the Fleet Valley NSA would have some intervisibility with the Proposed Development and potential effects on the Special Qualities are considered further in the EIAR **Chapter 5 LVIA and Technical Appendix 5-5**.

The ZTVs indicate that East Stewartry Coast and Nith Valley NSAs (13km and 25km distant respectively) would not have any notable intervisibility with the Proposed Development. Given the distance and lack of visibility, effects are likely to be less than Minor, and they are therefore not considered further.



Heritage Designations

There are a number of designated heritage assets within the 10km Study Area defined within **Chapter 10 Cultural Heritage**. A proportion of the Proposed Development Site lies within an Archaeological Sensitive Area (ASA) and likely corresponds to Loch Mannoch Bronze Age Settlement ASA. Another ASA, Grobdale, prehistoric landscape ASA is noted in the near vicinity.

There is one statutory landscape designation within a very limited section of the Site boundary's access area being the Fleet Valley National Scenic Area (NSA).

Ecology Designations

There are 12 environmental designations within 10km of the Proposed Development Site boundary which are summarised below:

- Galloway Oakwoods Special Area of Conservation (SAC) 4.2km west;
- Solway Firth Special Protected Area (SPA) 10 km south west;
- Airds of Kells Wood Site of Specific Scientific Interest (SSSI) 7.9km north east;
- Ardwall Hill SSSI 6.9km south west;
- Borgue Coast SSSI 7km south west;
- Cairnsmore of Fleet SSSI 7.6km west;
- Carstramon Wood SSS 4.2kml south west;
- Galloway Hills SSSI 10km west;
- Killiegowan Wood SSSI 6.3km south west;
- Lagganmullan SSSI 5km south west;
- River Dee (Parton to Crossmichael) SSSI 6.5km north east;
- Skyreburn Grasslands SSSI 9.4km west;
- Threave and Carlingwark Loch SSSI 5.4km east;
- Woodhall Loch 1.5km north;
- Loch Ken and River Dee Marshes Ramsar Site 5.4km north east;
- Cairnsmore of Fleet National Nature Reserve 7.6km north west;
- Culcaigrie & Trostrie Lochs Local Wildlife Site (LWS) 3km ;
- Carstramon Wood Scottish Wildlife Trust 3km west; and
- A 4.84 ha area of Ancient Woodland Inventory Site adjacent.

These are shown on Figure 2.



3 Site Selection and Design Evolution

3.1 Site Selection

The Proposed Development Site has been selected as suitable by the Applicant because it met the following criteria:

- There is a commercially viable grid connection;
- There is good wind resource;
- There is suitable orientation/topography and insolation levels for solar development;
- The land is available for development i.e. landowners willing to offer land for development;
- Other than a small section of the existing commercial forestry track that will be used to access the Proposed Development Site from the south west, the proposed infrastructure is not located within nationally designated areas;
- The Proposed Development Site is suitable for biodiversity enhancement and for restoration of peatland;
- The Proposed Development has the capacity to maintain suitable distance from the nearest residential properties and settlements; and
- The Proposed Development Site benefits from a good existing road network.

3.2 Design Principles

The positioning of the turbines, solar panels and associated infrastructure so that it maximises the electricity generation from wind and solar energy, whilst taking account of environmental and technical constraints and minimising the overall effects on sensitive receptors.

An initial review of the Proposed Development Site and surroundings indicated the following potential constraints:

- Landscape character and visual amenity;
- Presence of cultural heritage assets and receptors;
- Ground conditions, topography and peat;
- Proximity to noise sensitive receptors;
- Presence of watercourses, the potential for private water supplies and related infrastructure;
- Presence of corepaths, public roads, fixed telecommunication links;
- Presence of woodlands;
- Presence of sensitive ornithology receptors;
- Presence of ecological receptors; and
- Proximity to suitable grid connection.

As part of the design process, these constraints were evaluated in a stepwise fashion, broadly following the approach below:

- Desktop evaluation of available information and mapping;
- Survey work and ground-truthing of identified sensitive receptors; and



• Analysis of data gathered and assessment of potential effects.

On completion of this evaluation the site design was reviewed and altered as appropriate with the above process repeated to gather further information.

The process was based around four key design milestones:

- Feasibility Layout initial turbine and infrastructure layout generated based on a desk-top assessment of known mapped environmental constraints;
- Scoping Layout used as the basis for the EIA Scoping Report and associated consultation and the first round of public consultation;
- Design Chill Layout for initial evaluation and for the second round of public consultation; and
- Design Freeze Layout incorporating feedback from public and stakeholder consultation and used as the basis for the detailed assessment of potentially significant effects presented in this EIA Report (the Proposed Development).

As additional survey data and commentary from consultees and the public was assessed, further key design principles were established which were used to shape the design through the milestones above.

The design process was iterative with the design being refined as individual constraints were identified or modified. Significant effort was made to engage with consultees and the community regarding the energy park design and feedback received was central to design decision making.

Each design milestone detailed below was reviewed in the context of known constraints, engineering complexity and commercial viability. Comment on each design milestone was sought from the Statutory Consultees with comments fed back into the next iteration of the design.

As potentially significant effects are identified throughout the design process, the alteration of the design to address them is considered to be embedded mitigation or mitigation by design.

Through the application of this approach the Proposed Development has been designed to identify and minimise potentially significant effects ahead of the impact assessment presented in this EIA Report.

3.3 Design Consultation

During the pre-application process in October 2020, the Proposed Development consisted of 12 wind turbines (no solar panels or BESS) at 150m tip height plus associated infrastructure.

Following receipt of the pre-application response the design of the Proposed Development has evolved to feature 9 wind turbines (to include ground mounted solar and BESS) at 180m tip height plus associated infrastructure.

Since the initial feasibility layout was considered in 2020, wind turbine design has evolved. With wind turbines now available in the market featuring larger rotors than in 2020. This has allowed the applicant to optimise the wind turbine layout, facilitating a reduction in the number of wind turbines required to meet the minimum viable installed capacity, whilst maintaining necessary spacing between the larger turbines.



The current design reduces the potential for the stacking of wind turbines from key viewpoints, reduces the overall footprint resulting in reduced impacts on potential habitats, and improves the efficiency of the Proposed Development whilst maintaining the proposed installed capacity.

In August 2023, as part of the Scoping Report, the Applicant submitted an indicative site layout for the Proposed Development comprising of 9 turbines up to 180m tip height, ground mounted solar panels and BESS. Specific design comments in relation to Scoping are captured within the Table 4.1.

In general, the Scoping Opinion raised concerns regarding visibility of the Proposed Development with a focus on the design achieving an appropriate fit within nearby sensitive areas. Concerns were raised about the potential for impacts to the nearby national scenic areas and important archaeological areas.

As surveys and consultation progressed and understanding of the Proposed Development Site developed, further design workshops were held with the Applicant and technical experts contributing to the EIA.

Table 1 summarises consultation undertaken with key stakeholders specifically on the design of the Proposed Development, and how and where points raised have been addressed in this EIA.

Consultee	Consultation Summary	How and Where has this been addressed
ECU (EIA Scoping January 2024)	Ministers are aware that further engagement is required between parties regarding the refinement of the design of the proposed Development regarding, among other things, surveys, management plans, peat, radio links, finalisation of viewpoints, cultural heritage, cumulative assessments and request that they are kept informed of relevant discussions.	The Applicant has actively engaged with key consultees, and their recommendations have been carefully considered and incorporated into the final design through an iterative design process. Chapters 5 – 14 of this EIAR details the consultation undertaken to refine the design of the Proposed Development.
D&GC Roads Planning Team Leader (EIA Scoping January 2024)	It would be appropriate that any future application confirm the access route(s) and identify the full extent of proposed off-site road accommodation and mitigation works including passing place provision, carriageway strengthening, widening and alterations to road boundaries all along any proposed access route(s) necessary to permit construction traffic and the passage of component delivery vehicles (this may require land outwith the public road boundary and a separate planning consent may be required in respect of these works) and the potential impacts on utility services lying within the public road boundary.	Chapter 11 Transport & Access details the proposed access routes to site. An Abnormal Load Assessment has been undertaken as part of the application see Technical Appendix 11-1. A detailed review of any upgrades required will be undertaken following consent.
	All accommodation works must be designed and constructed to the satisfaction of the Planning Authority in	The Applicant will initiate engagement with D&GC Roads, Transport Scotland and Scotways regarding the required

Table 1: Summary of Design Consultation

Consultee	Consultation Summary	How and Where has this been addressed
	consultation with the Roads Authority and will require appropriate permits and consents to have been issued.	consents and permits post consent.
	Where public road boundaries are to be altered either for the formation of temporary accesses or for accommodation works, these should be reinstated in their original position at the conclusion of construction works (unless prior agreements have been secured with the Planning and Road Authorities).	The post construction remediation will be undertaken as agreed with authorities.
NatureScot (EIA Scoping January 2024)	 'Aspects that we consider could be sensitive to a development of this scale at this location would be; The enclosing eastern ridge 	Chapter 5 Landscape and Visual Impact Assessment discusses these specific points.
	becoming dominated or a reduction in its perceived scale by the large size of the turbines (noting that the turbines are proposed at 180m to tip, located upon landform that is 180 – 220m aod).	The Applicant has sought to minimise the impacts on these aspects as much as possible through the iterative design process. These comments have been a key consideration in the design work to date.
	 Policy woodland / hedgerows, mature broadleaved woodlands, can act as scale indicators potentially accentuating the perception of the large size of the wind turbines. In this NSA they also provide a strong underlying landcover pattern providing smaller scale and more 	Further consultation was undertaken with NatureScot regarding the draft design in February 2024, along with a request for further discussion regarding mitigation but resources did not allow for further engagement.
	 enclosed and intimate feeling in places, as well as making the landscape in the upper valley seem remote. Landscape scale and openness are particularly important characteristics in relation to wind turbines because large wind turbines can easily seem to dominate some landscapes. Detraction or a shift in focus from Gatehouse being the focal point in the valley as appreciated in views from the west. 	The number of turbines have been reduced from 12 to 9 in order to reduce the potential for the stacking of wind turbines from key viewpoints, particularly from key receptors within the Fleet Valley National Scenic Area (NSA). This was to address concerns raised during the pre- application stage from the D&GC landscape officer and NatureScot on potential impacts on the Fleet Valley NSA. Appropriate buffers from surrounding residential properties were maintained.
	 Adverse or poor scale relationship with respect to the location of the proposed Development close to the softer, enclosed and intimate upland part of the valley. The small size and extent of the NSA. Especially east to west, close to the 	After additional viewpoints were requested and further consultation was made, it was agreed with that no assessment of the proposed Galloway National Park would be required.
	development where it is only c.4km in width, the upland glen character could easily appear overwhelmed by turbines of the size proposed.'	
D&GC (Pre- Application	Reference is made to the Supplementary Guidance (SG) - Wind	Design advice contained within these studies has been included in the design



Consultee	Consultation Summary	How and Where has this been addressed
April 2021)	Energy Development: Development Management Considerations Part D and the Dumfries and Gallway Wind Farm Landscape Capacity Study (Appendix C of the SG)	development.
Historic Environment Scotland (EIA Scoping January 2024)	There are a number of nationally important historic environment assets within our remit in the vicinity of the development whose settings have the potential to be adversely impacted by the proposals as they stand. In particular, at this stage we have concerns about Loch Mannoch, cairn and stone circle (SM1033). These are further discussed in the annex to this letter. Should the proposed development progress, we recommend that if impacts on the setting of monuments from turbines in the proposed scheme prove capable of mitigation, this should be taken into account and inform the iterative design process. The applicant	Loch Mannoch, cairn and stone circle (SM1033) has formed a key consideration in design work to date. This has included considering the height, number and location of turbines proposed and has considered the potential for impact upon the asset in views from it as well as considering the Proposed Development in views towards the asset with an aim of minimising potential impacts upon the asset's setting. During the heritage walkover survey, previously recorded non-designated heritage assets, such as field systems and farmsteads, were identified and matched records in the National Record of the Historic Environment. The scoping layout
	may wish to explore design options which change the development layout, turbine heights and number of turbines in order to identify whether significant adverse impacts can be mitigated. We strongly recommend that further engagement with ourselves in undertaken as the development progresses	has been designed to avoid direct impacts to these assets as much as possible (including the Loch Mannoch Archaeologically Sensitive Area). ZTV analysis has been undertaken to determine potential impacts on two scheduled monuments within 1km of the Proposed Development (Loch Mannoch scheduled cairn and stone circle and Edgarton Mote fort) with the positioning of the turbines and solar infrastructure taking into consideration these sensitive receptors.
SEPA (EIA Scoping January 2024)	Existing built infrastructure must be re- used or upgraded wherever possible. The layout should be designed to minimise the extent of new works on previously undisturbed ground. Cabling must be laid in ground already disturbed such as verges. A comparison of the environmental effects of alternative locations of infrastructure	Efforts have been made to utilise existing infrastructure including access tracks as much as possible in the design freeze to minimise the extent of new works on previously undisturbed ground. Cabling associated with the Proposed Development is anticipated to be laid in road verges.
	elements, such as tracks, may be required.	The final layout of the infrastructure associated with the Proposed development has been carefully designed to minimise impacts on environmental constraints primarily sensitive ecological habitats, peat and the hydrological environment.
	The site layout must be designed to avoid impacts upon the water environment. Where activities such as	The Proposed Development has been designed to minimise impact on the hydrological environment as much as

Consultee	Consultation Summary	How and Where has this been addressed
	watercourse crossings, watercourse diversions or other engineering activities in or impacting on the water environment cannot be avoided then the submission must include justification of this and a map showing: (a) All proposed temporary or permanent infrastructure overlain with all lochs and watercourses.	possible and Chapter 8 provides a full assessment of potential impacts on the hydrological environment as a result of the Proposed Development – see figure 5. Generally, a minimum buffer of 50m to watercourses and waterbodies has been applied, except for water compatible elements within the Solar Development area.
	(b) A minimum buffer of 50m around each loch or watercourse. If this minimum buffer cannot be achieved each breach must be numbered on a plan with an associated photograph of the location, dimensions of the loch or watercourse and drawings of what is proposed in terms of engineering works.	Development, including all the proposed turbines, proposed BESS and associated wind infrastructure, is located outwith the watercourse 50m buffer. No development is proposed within 10m of any watercourse or waterbody. The design mitigation principles can be found in the outline CEMP , Technical Appendix 15-1 .
	(c) Detailed layout of all proposed mitigation including all cut off drains, location, number and size of settlement ponds.	No abstractions or dewatering are proposed.
	If water abstractions or dewatering are proposed, a table of volumes and timing of groundwater abstractions and related mitigation measured must be provided. Watercourse crossings must be designed to accommodate the 0.5% Annual Exceedance Probability (AEP) flows or information provided to justify	It is confirmed watercourse crossings will be designed to accommodate the 0.5% AEP flows plus an allowance for climate change. A screening of flood risk is presented in Chapter 8 . A flood risk and drainage impact assessment for the proposed solar and BESS areas are discussed in Technical
	smaller structures. If it is thought that the development could result in an increased risk of flooding to a nearby receptor then a Flood Risk Assessment must be provided in support of the submission.	6.
	The planning submission must: (a) Demonstrate how the layout has been designed to minimise disturbance of peat and consequential release of CO2 (b) Outline the preventative/mitigation measures to quaid significant	The design of the Proposed Development has minimised the impact on peat as much as possible with avoidance of areas of deeper peat (>1m) being a key consideration in the design process.
	drying or oxidation of peat through, for example, the construction of access tracks, drainage channels, cable trenches or the storage and re-	The peat depths, figures and storage areas are detailed in the Peat Management Plan. See Technical Appendix 8-2 .
	use of excavated peat. A detailed map of peat depths with all	



Consultee	Consultation Summary	How and Where has this been addressed
	built elements (including peat storage areas) overlain to demonstrate how the development avoids areas of deep peat and other sensitive receptors such as Groundwater Dependent Terrestrial Ecosystems.	
	A map must be provided demonstrated that all Groundwater Dependent Terrestrial Ecosystems (GWDTE) are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions.	Areas identified as potentially groundwater dependent within the Proposed Development Site are likely to be sustained by incident rainfall and local surface water runoff rather than groundwater. See Volume 4, Figure 8-8 of this EIAR for habitats initially considered as potentially ground water dependent.
Defence Infrastructure Organisation (MOD)	The development proposed includes wind turbine generators and/or meteorological mast(s) that exceed a height of 150m agl and are therefore subject to the lighting requirements set out in the Air Navigation Order 2016. In addition to CAA requirements, the MOD will require the submission, approval and implementation of an aviation safety lighting specification that details the installation of MOD accredited aviation safety lighting.	An aviation lighting scheme has been agreed with the CAA and is presented in Technical Appendix 14-2 . All turbines will be fitted with Infra-Red as per MOD specification. The aviation lighting specification will be submitted to the MOD for approval following receipt of planning permission.

3.4 Design Evolution

Since the submission of the EIA Scoping Report and following the receipt of the EIA Scoping Opinion; the Applicant has undertaken several design iterations to address the consultee comments and minimise the environmental impacts.

These iterations have taken into consideration the existing tracks and on-site environmental and engineering constraints and the local landscape, including avoidance and/or appropriate buffering of watercourses, peat and sensitive habitats.

Table 2 summarises the key design iterations that have taken place including preapplication and scoping layout, design chill and design freeze. The Design Evolution Layout Overview are shown on Figures 3 and 4.

IT Layout	Turbines	Tip Height (m)	Design Changes
1: Feasibility Layout / Pre Application Layout	12	180m	 Initial feasibility based on preliminary environmental and technical considerations including: Consideration of wind resource including optimisation of energy yield and consideration of surrounding forestry; Initial review of landscape and visual baseline conditions and potential impacts upon residential amenity and key views (particularly the Fleet Valley Regional and National Scenic area), consideration of fitting the design within local topography;

Table 2: Main Design Iterations



IT Layout	Turbines	Tip Height	Design Changes
			 Initial review and appraisal of the historic environment of the Site and surrounding area, including historical landscapes and cultural heritage assets (particularly the Loch Mannoch Cairn and Stone Circle and Loch Mannoch Archaeologically Sensitive Area); Initial review of ornithological and ecological baseline conditions and potential impacts including nearby SPA's, SSSI and SAC's; Initial review of hydrology, hydrogeology and soils through a desk-based assessment; Initial review of various access options including abnormal loads access; Consideration of site gradient; Initial review telecoms links and offsets through a desk-
			 Initial review of other baseline conditions for disciplines including noise and aviation.
2; Scoping Layout (also includes ground mounted solar and BESS)	9	180m	Following advancements in market technology and policy support of mixed-use (hybrid) technologies in order to maximise the potential energy output of the site, ground mounted solar and battery storage have been added to the project increasing the potential installed capacity to 100MW. The number of wind turbines was also reduced from 12 to 9 to address known landscape and visual impact constraints, as well as respond to market changes in wind turbine technology since the pre application process, allowing less turbines with larger rotors. Landscape and Visual The number of turbines was reduced from 12 to 9 in order to reduce the potential for the stacking of wind turbines from key viewpoints especially from key receptors with the Fleet Valley NSA following concerns raised during the pre-application stage from the D&GC landscape officer and NatureScot on potential impacts on the Fleet Valley NSA. Appropriate buffers from surround residential properties were maintained. Cultural Heritage During the heritage assets, such as field systems and farmsteads, were identified and matched records in the National Record of the Historic Environment. The scoping layout was designed to avoid direct impacts to these assets as much as possible (including the Loch Mannoch Archaeologically Sensitive Area). ZTV analysis was undertaken to determine potential impacts on two scheduled monuments within 1km of the Proposed Development (Loch Mannoch scheduled cairn and stone circle and Edgarton Mote fort) with the positioning of the turbines taking into consideration these sensitive receptors. <u>Ecology</u>



IT Layout	Turbines	Tip Height (m)	Design Changes
			 M15b, M25 and M25a. The scoping layout has evolved to prioritise avoidance of these habitats (alongside other constraints) where possible. The scoping layout also considered other ecological constraints including maintaining appropriate buffers from potential bat roost, red squirrel dreys and neighbouring woodland. <u>Hydrology, Hydrogeology, Peat and Soils</u> The following changes were made to the Proposed Development as a result of the findings of the phase 1 peat probing: The access track up to T2 was adjusted to avoid deep peat; and Areas of peat greater than 0.5m are avoided where possible, or where this was not possible with other environmental constraints, infrastructure was moved to as shallow peat as possible. The scoping layout took into consideration watercourse buffers where other constraints allowed. <u>Transport & Access</u> Access to the Proposed Development included two options either directly from the east (take the A762 and access site directly from the east) or directly from the
3: Design Chill	0	180m	north (continue along the B795 to the existing forestry tracks).
	7		 Incorporated into the design: T8 was moved west to avoid deeper peat and priority peatland habitat (M15/M25); T9 was also moved west in order to avoid steeper gradients on site; T6 was moved northeast to remove it from appropriate woodland buffers and to avoid deeper peat and priority peatland habitat (M15/M25); T1 was moved east to avoid deeper peat and priority peatland habitat (M15/M25); T1 was moved east to avoid deeper peat and priority peatland habitat (M15/M25); T5 was moved northeast to avoid deeper peat and priority peatland habitat (M15/M25); T5 was moved northeast to avoid watercourse and woodland buffers; Access tracks and associated infrastructure were updated to account for the new turbine locations avoid locations with peat greater than 0.5m deep (where possible).
4; Design Freeze Layout	9	180m	Following community consultation, the Applicant has discounted the previously considered access from the North to address the local communities concerns in relation to access. The Proposed Development now features two site access options: directly from the east as previously proposed (A762) and a new option from the south west following the B727 before turning onto an existing forestry track. The final design has seen further minor adjustment in position of T9, T6, T5 and T4 in response to further consideration in relation to peat and non-designated cultural heritage assets



IT Layout	Turbines	Tip Height (m)	Design Changes
			As the Proposed Development site access now considered an access point from the south west, the internal access tracks have been redesigned to allow for sufficient access of components to site. The final internal access design also takes into consideration engineering constraints and minimisation of required excavation works.



4 Final Design Overview

The Proposed Development would consist of nine wind turbines each with a tip height of 180m above ground level (agl), ground mounted solar panels, battery energy storage system (BESS) and associated infrastructure including:

- 6.1 kilometres (km) of upgraded existing access track;
- 12.64km of new access track (of which 12.15km will be cut and 0.49km will be floated);
- Turbine foundations and crane hardstandings;
- Substation;
- One borrow pit;
- Underground cabling;
- Temporary construction compound;
- Solar infrastructure including a power station and switching and breaking station; and
- Up to eight watercourse crossings.

The final layout of the Proposed Development has sought to site infrastructure as far as possible in areas of appropriate topography, to avoid areas of deep peat and sensitive habitats, minimise the effects on landscape receptors and heritage assets (amongst other environmental and technical constraints).



5 Access

5.1 Proposed Development Site Access

Access to the Proposed Development Site is anticipated to be from the southwestern access point which travels north on the B727 before turning onto an existing substantial forestry track. From here it travels a distance of approximately 7km before leaving the existing forestry track and turning north to the Proposed Development infrastructure.

The southwestern access point will be used to transport the abnormal loads (such as the wind turbines) as well as servicing the western side of the Proposed Development.

The Proposed Development features two access points. Access to the Proposed Development included two options either directly from the east (taking the A762 and accessing the Proposed Development Site) or directly from the north (continuing along the B795 to the existing forestry tracks). The access routes in the east of the Proposed Development Site will be used to service the eastern side of the Proposed Development.

The above access route design will reduce traffic load on any one road into the Proposed Development Site by virtue of splitting up the vehicle movements across different roads and access points.

The preferred Port of Entry (PoE) for the turbine components has been identified as the King George V (KGV) Docks in Glasgow from where the Abnormal Loads (AL) vehicles would navigate onto the M8 motorway and then onto the M74 Trunk Road. The AL would then travel to the Proposed Development Site via the following route:

- From KGV docks onto the M8;
- Transporter vehicles would then join the M74 from the M8 to travel south-east towards Abington where the route continues onto the A74(M);
- The vehicles would then join the M6 and continue to Carlisle;
- At Carlisle, the vehicles would exit the M6 at Rose Hill Roundabout to return back onto the M6 to head north-east;
- The transporters would exit the M6 at Grena Green to join the A75(T) to heading west through Dumfries; and From the A75(T) the vehicles would turn onto the B727 and then travel to the Proposed Development Site access point via forestry tracks.

Site access is discussed further in Chapter 11 Transport and Access.

5.1.1 Access Track

Existing tracks would be utilised as much as possible to reduce the need for new access track and thus minimising the construction traffic and resulting environmental impact.

The tracks will be designed to have sufficient radii for turning of the construction vehicles, abnormal loads and associated plant. The access tracks have been designed to avoid sensitive features.

Generally, the surface of the track will be flush with or raised slightly above the surrounding ground level.

Where the presence of peat has been identified to be greater than 0.5m in depth, floating tracks are proposed to be used (where gradients allow and where lengths and



cut and fill requirements do not preclude their construction). Layers of crushed stone (depth dependant on ground conditions) will be laid on geotextile/geogrid reinforcement to form the track, which results in the site track being raised above the peat surface.

Soils removed from the excavated area will be stored separately in piles, no greater than 3m in height, directly adjacent to, or near the tracks on ground appropriate for storage of materials i.e., relatively dry and flat ground, a minimum of 50m away from any watercourses. Wherever possible, reinstatement of ground disturbed to facilitate construction of the track will be carried out as track construction progresses.

Prior to the commencement of site construction, detailed engineering specification for the access track design will be submitted to the planning authority as part of a Planning Conditions Compliance Statement, which will include Construction Method Statements for all aspects of construction.

Access Track Drainage

The drainage design will comply with General Binding Rules (GBR's) 10, 11 and 21 for the track drainage, under the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 (as amended) (Scottish Environment Protection Agency (UK Government, 2021).

Consideration of Alternatives

The preferred on-site track routes have been designed to allow access to the turbine locations taking environmental constraints into account.

The proposed on site access tracks have sought as far as possible to be sited in areas of appropriate topography, to avoid areas of deep peat and sensitive habitats, minimise the effects on landscape receptors and heritage assets.

Public Access

Core path 'Gatehouse to Glengap' (reference TWYN/18/17) follows the route of the proposed southwestern access track from the entrance to the Site (the junction of the existing forestry track with the B727 to the east of Gatehouse of Fleet) to the point where the proposed access track leaves the route of the existing forestry track to turn north towards the main site infrastructure.

It is anticipated that during the construction of the Proposed Development that access to this core path may be limited for health and safety purposes. Mitigation in the form of public engagement and signage before and during construction is proposed and it is anticipated that upon completion of construction of the Proposed Development that there will be no further notable impact to this core path.

The Applicant is committed to providing and maintaining public access to the access road network. This includes provision of waymarked trails, signage and interpretation boards as appropriate.



5.1.2 Watercourse Crossings

The Proposed Development has been designed to minimise construction works in the vicinity of mapped watercourses and to minimise the need for new water crossings in order to reduce the risk of pollution and changes to watercourse morphology.

Up to eight new watercourse crossings (visible on OS 1:25,000 mapping) will be required for the proposed new access tracks within the Proposed Development Site, these locations are shown in Figure 5 and summarised in Table 3.

The watercourse crossings will be designed in accordance with relevant guidance (WAT-SG-25), and designed to accommodate 1 in 200-year events.

Crossing ID	Easting	Northing	Proposed Crossing Type
WC1	265089	560322	Culvert
WC2	265084	560154	Culvert
WC3	264953	559942	Bridge
WC4	264902	560795	Culvert
WC5	264860	562138	Culvert
WC6	265845	562366	Bridge
WC7	267431	561415	Culvert
WC8	267696	560894	Bridge

Table 3: Major Watercourse Crossing Summary

5.1.3 Construction Programme

Subject to receipt of planning permission and discharge of pre-commencement conditions; construction works are anticipated to commence in 2028 with a total duration estimated at approximately 12 - 18 months. The work will proceed in four phases as summarised in Table 4, assumed 12 months for the purposes of this table:

Table 4: Construction Programme

Phase	Summary of Works
Phase 1 (months 1 and 2); Enabling/Access Works;	Construction of new access routes from existing access tracks to the turbine locations.
Phase 2 (month 3 to 10); Development (Main Site)	Establishment of site facilities, turbine foundation and turbine cabling. Delivery of turbine components & installation with cranes.
Phase 3 (month 10 to 12); Commissioning	Testing and commissioning equipment and turbines.
Phase 4 (month 12); Reinstatement and Restoration	Removal of temporary facilities and re- instatement of temporary working areas. Restoration of working areas as set out in the Schedule of Mitiaation and CEMP.

The proposed normal hours of operations for construction activity are between 07:00 - 19:00 Monday to Friday, and 07.00 - 13.00 on Saturdays. During construction and installation, there may be a requirement for extended working hours as some critical elements of installation cannot be stopped once started such as concrete pouring, this will be agreed in advance with D&GC.



6 Conclusion

This document provides an overview of the design process undertaken by the Applicant.

The careful placement of infrastructure within the Proposed Development Site has facilitated effective mitigation to reduce the potential for significant effects through the design process.

This document has described the principles that have shaped and influenced the design of the Proposed Development and how issues of access have been addressed.

The Proposed Development has undergone numerous iterations taking into account feedback from statutory consultees and the local community. This has resulted in a development which is sympathetic to the local landscape and environmental sensitivities.



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Lairdmannoch Energy Park

wínd2

Figure 5 Proposed Development Layout Overview

<u>Key</u>		
	Site boundary	
★	Turbine Location	
<u>Winc</u>	<u>l infrastructure</u>	
	Turbine foundation	
	Crane hardstanding	
	Auxillary crane area	
	Tower storage	
	Blade storage	
	Substation and BESS	
	Construction compound	
\boxtimes	Borrow Pit	
Acc	<u>ess tracks</u>	
	Access track - cut	
	Access track - floating	
	Access track - upgraded /	
	widened	
	Access track - solar	
\otimes	Watercourse crossing	
<u>Solai</u>	<u>r infrastructure</u>	
	Solar panel	
	Power Station	
	Switching and Breaking Statio	n
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